



ASD(NII)/DoD CIO



Enterprise-Wide
Systems Engineering

Spanning the Government
and the Globe

Introduction

The **Assistant Secretary of Defense for Networks and Information Integration/Department of Defense Chief Information Officer [ASD(NII)/DoD CIO]** provides the leadership to meet the Net-Centric vision and ultimately deliver the critical enabling capabilities required by the National Defense Strategy. Transforming to a Net-Centric Force requires fundamental changes in process, policy, and culture across the Government (defense, operations, intelligence functions, and business processes)—and across the globe.

The technology change will be significant, but the **cultural shift** may be even more challenging. The hallmark of the 21st century is **uncertainty**, Net-Centricity is rooted in a simple principle: **Confront uncertainty with agility**. To be agile, data can no longer be “owned”... it must be shared. Because warfighter safety hinges on the availability of trusted information—and each service branch has traditionally had its own policies, procedures, hardware, and software to deal with collection, distribution, and use—establishing common ground for information sharing must be our top priority.

Creating a DoD-wide information enterprise differs significantly from managing the individual platform-oriented programs used in the past. Enterprise-Wide Systems Engineering (EW SE) policies and safeguards will enable the GIG to achieve the end-to-end (E2E) interoperability and performance necessary for a trusted resource capable of spanning the government and the globe.

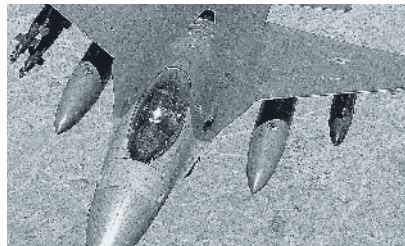
The Office of the Secretary of Defense for Networks and Information Integration (OSD/NII) is leading DoD's effort to transition all existing and future resources to a common global enterprise with E2E interoperability—the Global Information Grid (GIG).

EW SE Vision

To provide effective guidance and direction for the ongoing evolution of the Global Information Grid (GIG).

EW SE Mission

To provide the ASD(NII)/DoD CIO with Enterprise-Wide Systems Engineering (EW SE) methods and products to enable the GIG to comply with the E2E governing principles for interoperability and performance needed to support DoD business, intelligence, and warfighting operations across the government and around the globe.



EW SE Strategy

The EW SE strategy is to field a GIG capable, flexible, and affordable, built to the greatest extent possible on commercial Internet information technology (IT) supplied by the industrial base. This involves:

- ▶ Defining essential enterprise-wide functions.
- ▶ Establishing a GIG interoperability performance framework.
- ▶ Capturing key enterprise governing principles for interoperability.
- ▶ Working closely with commercial Internet IT industry and standards bodies to ensure DoD's understanding of available and anticipated commercial technologies that could be used to support the GIG.
- ▶ Identifying areas that will require DoD investment.
- ▶ Providing technical input to the ASD(NII)/DoD CIO to support Acquisition, Technology, and Logistics joint portfolio management processes and investment decisions.
- ▶ Jointly involving the user community and GIG development community through ongoing experimentation and rapidly developed pilot capabilities that invite informed user input.
- ▶ Ensuring program compliance with the GIG technical foundation through ASD(NII)/DoD CIO oversight and influence over DoD budget and acquisition processes.

Five goals must be addressed by the EW SE Strategy to achieve a GIG that meets user needs and enhances operational effectiveness.

Five Goals

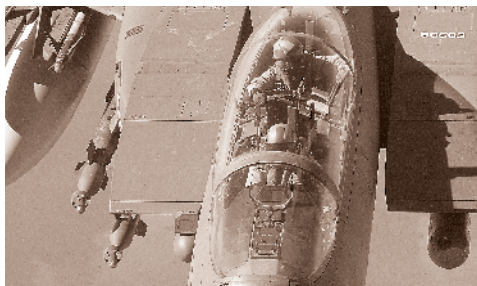
- ▷ Provide continuous oversight of the GIG's evolution
- ▷ Maintain an enterprise-wide technical foundation to build the GIG
- ▷ Establish GIG enterprise-wide analysis capabilities
- ▷ Oversee GIG enterprise-wide experiments
- ▷ Establish a GIG compliance oversight program

Goal 1

Provide continuous oversight of the GIG's evolution.

EW SE provides technical input to the ASD(NII)/DoD CIO, who has been charged with developing and implementing Net-Centric policies, oversight, guidance, architecture, and strategic approaches on a DoD enterprise-wide basis to enable Defense transformation. This includes the governing principles of information assurance as well as interoperability with national and alliance/coalition systems.





Major Activities

- ▶ Create and implement an EW SE plan for achieving secure GIG interoperability and performance. This plan will identify and describe enterprise-wide system engineering processes, products, and schedules.
- ▶ Develop and institutionalize capabilities-based enterprise risk management strategies and processes to ensure early identification and mitigation of enterprise risks.
- ▶ Invite industry to vet governing principles of GIG interoperability and identify those that could be supported by commercial technology and those which must be developed by DoD.
- ▶ Adopt industry best practices.
- ▶ Implement a GIG configuration management process to track and control changes to documents, policies, and directives that impact the evolution of the GIG.



Goal 2

Maintain an enterprise-wide technical foundation to build the GIG.

EW SE will develop, evolve, and maintain the GIG enterprise-wide technical foundation, which will characterize and document E2E guidelines for performance, interoperability, and security as well as essential network-enabling protocols, standards, and implementation conventions. This technical foundation will guide Program Managers in the ongoing development of improvements to the GIG.





Major Activities

- Develop an evolving overarching architecture and flow-down of E2E governing principles for functionality, performance, and interoperability. GIG functions include Transport, Core Services, Applications and Other Services, Computing Infrastructure, Enterprise Management, and Information Assurance.

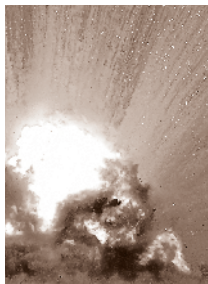
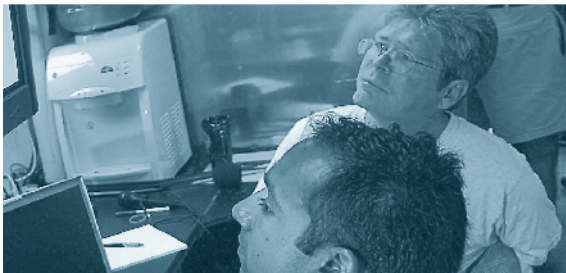
- Develop and maintain GIG documentation to ensure enterprise-wide interoperability and performance.
- Identify protocols, standards, and implementation conventions for the GIG, leveraging commercial IT whenever possible.
- Evolve the technical foundation to ensure it remains agile and current, addresses policy, incorporates technology, and delivers operational suitability.
- Create strategies and processes to encourage effective user involvement in creating and maintaining the GIG EW SE technical foundation.

Goal 3

Establish GIG enterprise-wide analysis capabilities.

EW SE will support the ASD(NII)/DoD CIO in establishing an enterprise-wide analysis capability that supports the evolution of the GIG technical foundation. This capability will enable the creation of quantifiable and repeatable assessments of solutions to provide E2E interoperability and performance.





Major Activities

- ▶ Analyze and recommend technical approaches to incorporate into the evolving GIG technical foundation.
- ▶ Leveraging existing government, contractor, and industry tool sets to implement an E2E GIG analysis, modeling and simulation, and emulation capability for performance, cost and risk by.
- ▶ Evolve the technical foundation to solve capability shortfalls identified through enterprise-wide analysis.
- ▶ Perform analysis to support compliance activities that ensure programs and user applications perform across the GIG.



Goal 4

Oversee GIG enterprise-wide experiments.

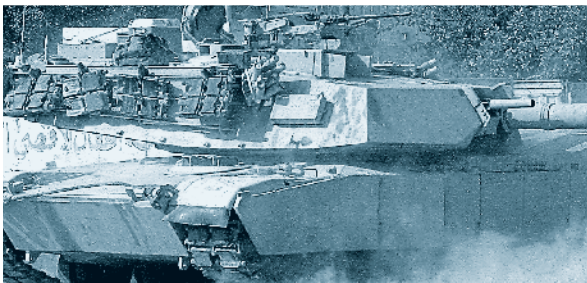
EW SE will assist the ASD(NII)/DoD CIO in the development and conduct of enterprise-wide experiments that prove the viability of the evolving GIG technical foundation.



Major Activities



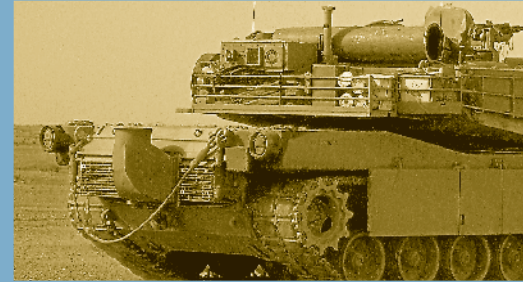
- ▶ Work with the Services, Agencies, coalition partners, and non-governmental organizations to leverage existing and planned experimentations to evaluate, select, and validate GIG technical foundation.
- ▶ Develop test plans and procedures that establish a consistent basis for E2E characterization of GIG operational interoperability and performance.
- ▶ Employ emulation test beds to characterize E2E performance.
- ▶ Oversee E2E experiments for key GIG programs, and use results to inform the technical foundation, future experiments, and characterization activities.



Goal 5

Establish a GIG compliance oversight program.

EW SE will enable the ASD(NII)/DoD CIO to enable Net-Centric operations and oversee the execution of GIG compliance management efforts to ensure interoperability and performance, support governance of the GIG evolution, and ensure compliance with the technical foundation. This will require engagement with key GIG programs throughout their acquisition cycles—within programs and portfolios as well as across portfolios and the enterprise.





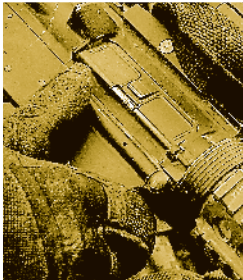
Major Activities

- ▶ Assist portfolio managers and key GIG programs, as needed, in interpreting enterprise guidance and standards to successfully meet E2E governing principles for functionality, interoperability, and performance.
- ▶ Establish the Department process that assigns Service and Intelligence Community CIOs with the responsibility and accountability for program compliance management
- ▶ oversight with regard to GIG compliance.
- ▶ Perform compliance assessments for key GIG programs at the appropriate milestones. Develop recommendations for bringing programs into compliance, as necessary.
- ▶ Identify compliance issues and risks, and incorporate into the Enterprise-Wide Risk Management Plan.
- ▶ Ensure that compliance management processes are agile, comprehensive, and rapidly capture evolutionary changes of the technical foundation.



Goal 5 Major Activities

continued



- ▶ Create enterprise-wide systems engineering compliance and net-ready review strategies and processes to foster a unified GIG developed in accordance with DoD directives, policies, and standards promoting Net-Centric operations.
- ▶ Support EW SE decision opportunity planning using approved GIG program acquisition and deployment schedules to better define technical maturation timelines.
- ▶ Define, as part of the portfolio management process, a value proposition assessment framework for the GIG that will be used to evaluate technical viability and the costs and benefits of programs at key acquisition decision opportunities.
- ▶ Apply the value proposition framework to support investment decisions using the enterprise-wide analysis capability. Maintain a repository of the decisions and the basis for the decisions.
- ▶ Coordinate investment decisions, including the identification of opportunities to be pursued and supported in the Program Objective Memorandum, and determine whether programs are ready for deployment.
- ▶ Support key decision opportunities via informed decisions on the technical foundation with regard to GIG capabilities, budget, and compliance with governing principles of functionality, interoperability, and performance.

Summary

The continued evolution of the GIG will provide new and enhanced capabilities for use by warfighters and related DoD communities. EW SE will be there to provide system engineering input to ASD(NII)/DoD CIO strategy that guides GIG evolution, supports ASD(NII)/DoD CIO governance responsibilities, and assists in execution oversight—enabling the ASD(NII)/DoD CIO to better manage risks inherent in the GIG enterprise evolution by facilitating advanced planning, justification, and feasibility evaluations of proposed capability enhancements.

Beyond battlefield applications, a network-centric force can increase efficiency and effectiveness across defense operations, intelligence functions, and business processes by giving all users access to the latest, most relevant, most accurate information.

National Defense Strategy (2005)



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